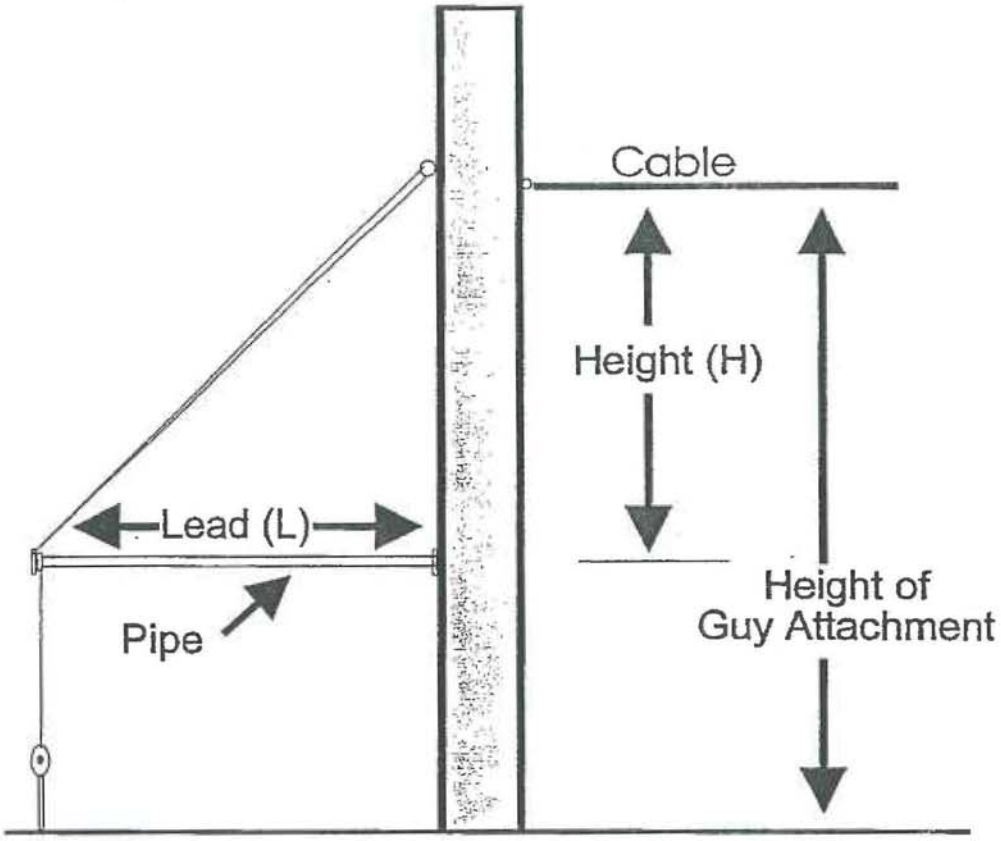
Sidewalk Anchor Guys

Sidewalk anchor guys are used in guying over sidewalks or other pathways where right-of-way is insufficient to permit placing a guy with required clearance above the sidewalk.



The size of strand required for a sidewalk guy is greater than that indicated by the Anchor/Guy Computer: *

Indicated by Guy Rule	2.2M	6M	10M	12M	16M
Required for Sidewalk Guy	6M	10M	16M*	20M**	25M

***20M if height of guy attachment is 20 feet or less.**

****22M if height of guy attachment is 18 feet or less.**

Pipe sizes and lengths for sidewalk anchor guys are as follows:

Use 2-inch pipe for lengths up to those given below. For longer lengths, use 2 1/2 inch pipe.

Guy Size	6M	10M	12M	16M	20M	25M
Max. Length of 2-Inch Pipe (Ft.)	12	11	10	9	8	7

Pole size with sidewalk anchor guys are as follows:

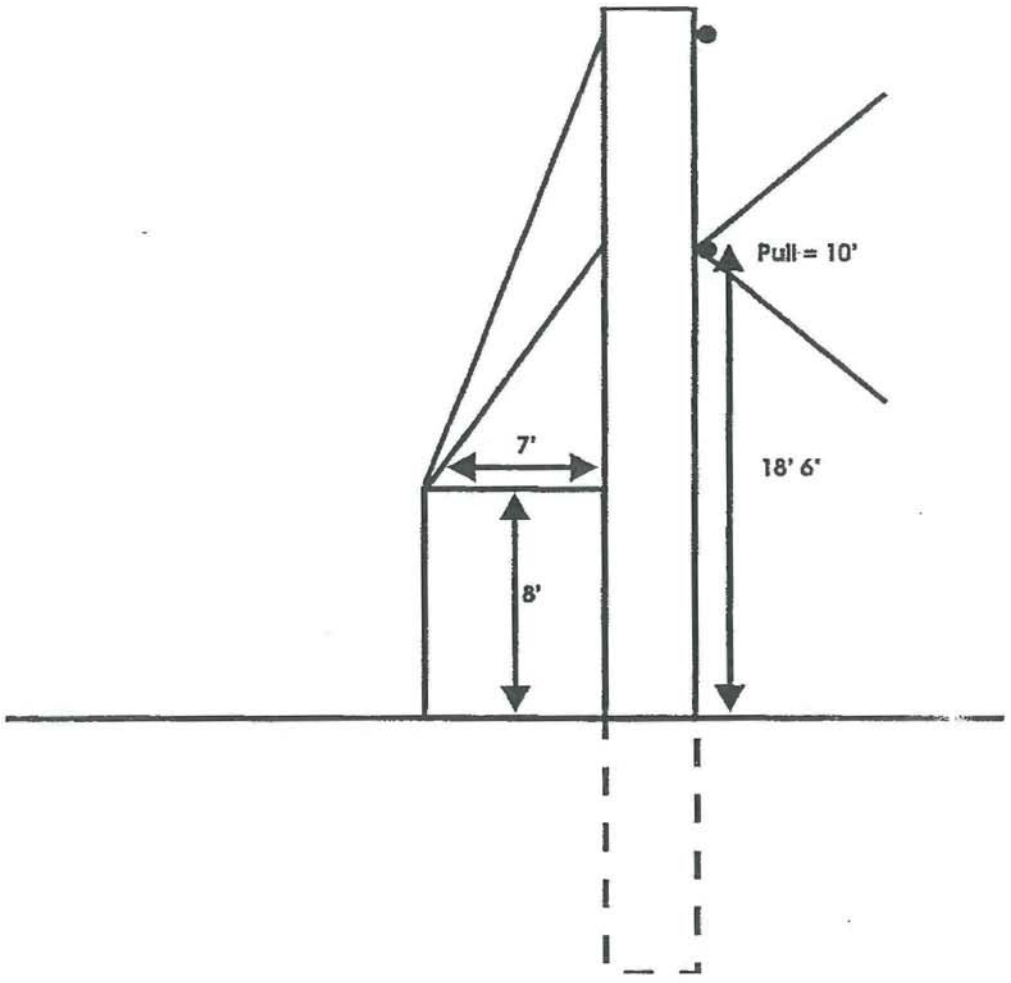
Lead/ Height	Size of Sidewalk Anchor Guy					
	6M	10M	12M	16M	20M	25M
	Class of 30-Ft SP Pole					
2/5	7	5	4	3	2	2
1/2	6	4	3	3	2	1
3/5	5	4	3	2	1	1
4/5	5	3	2	1	1	1
1/1	5	3	2	1	1	1

Note: Poles of other lengths may also be used provide their circumferences 6 feet from the butt are not less than those of the classes of 30 foot southern pine poles indicated above. See Practice 621-020-011 for pole dimensions.

Sidewalk Anchor Guy Example

Determine the pole class and anchor strength for a sidewalk fixture, given the following conditions:

- Attachments at maximum load.
  - One 6M (6000 lbs).power guy strand attached at the top of the pole
  - One 10M (11500 lbs.) telephone strand attached at 18'6"
- Pull on pole is 10'
- Lead is 7'



Solution to Sidewalk Anchor Guy Example

For this example use the Anchor/Guy Computer.

Step 1 Figure Lead over Height as a decimal:

- Lead = 7'
- Height = 18'6", but we know by definition of a sidewalk fixture, that the pipe will be attached at 8', so we must adjust the height accordingly:
- 18'6" - 8' = 10'6"
- Therefore L/H = .66

Step 2 Determine the tension of the 10M strand using the Communication Tensions Table - 6.9M lbs.

Step 3 Set pull on pole, 10' (SCALE B), opposite lead over height, .66 (SCALE A). Find the guy requirement (SCALE D) opposite 6.9 on SCALE C. Guy requirement of 4.4M lbs - 6M strand.

Step 4 Refer to Sidewalk Anchor Guy Table inside the computer. 6M by guy rule denotes a 10M sidewalk guy requirement.

Step 5 Figure Anchor rod size:

- Total the strand tensions
- 10M Telephone strand + 6M Power strand = 16M
- Rod required is 3/4" which supports up to 18M

Step 6 Figure pole class required by matching L/H (.66 not listed, move up to .8 reference) with the guy tension of 16M on the Sidewalk Anchor/Guy table on the inner sleeve. Class 1 pole is required.

Clearances for Aerial Plant

Appropriate horizontal and vertical clearance must exist between our plant and other objects (i.e. the wires for other utilities, permanent structures and traffic).

Practices on clearances are summarized in document 11 of the Customer Services Engineering portion of the Outside Plant Engineering Lotus Notes database.

Customer Services Engineering

Main Heading:Document 011 Issue#:

Description: Clearances–Aerial

CLEARANCES FOR AERIAL PLANT

CONTENTS

11.01 General

11.02 Voltage--A Factor in Clearance

A. Three-Phase "Y" Connection

B. Common Multigrounded Neutral

C. Delta System

11.03 Spacer Cables

11.04 Horizontal Clearances--Poles And Stubs

11.05 Power Cables

11.06 Clearances--Telephone Wire And Cable

11.07 Clearances--Crossing Roads, Alleys, Walkways, Etc.

11.08 Clearances--Running Along Roads, Etc.

11.09 Clearances--Crossing Railroad Tracks

11.10 Reduced Ground Clearances When Point Of Crossing Is Not At Midspan

11.11 Ground Clearances For Electric Facilities

11.12 Clearances And Movement Envelopes--Conductor Crossing

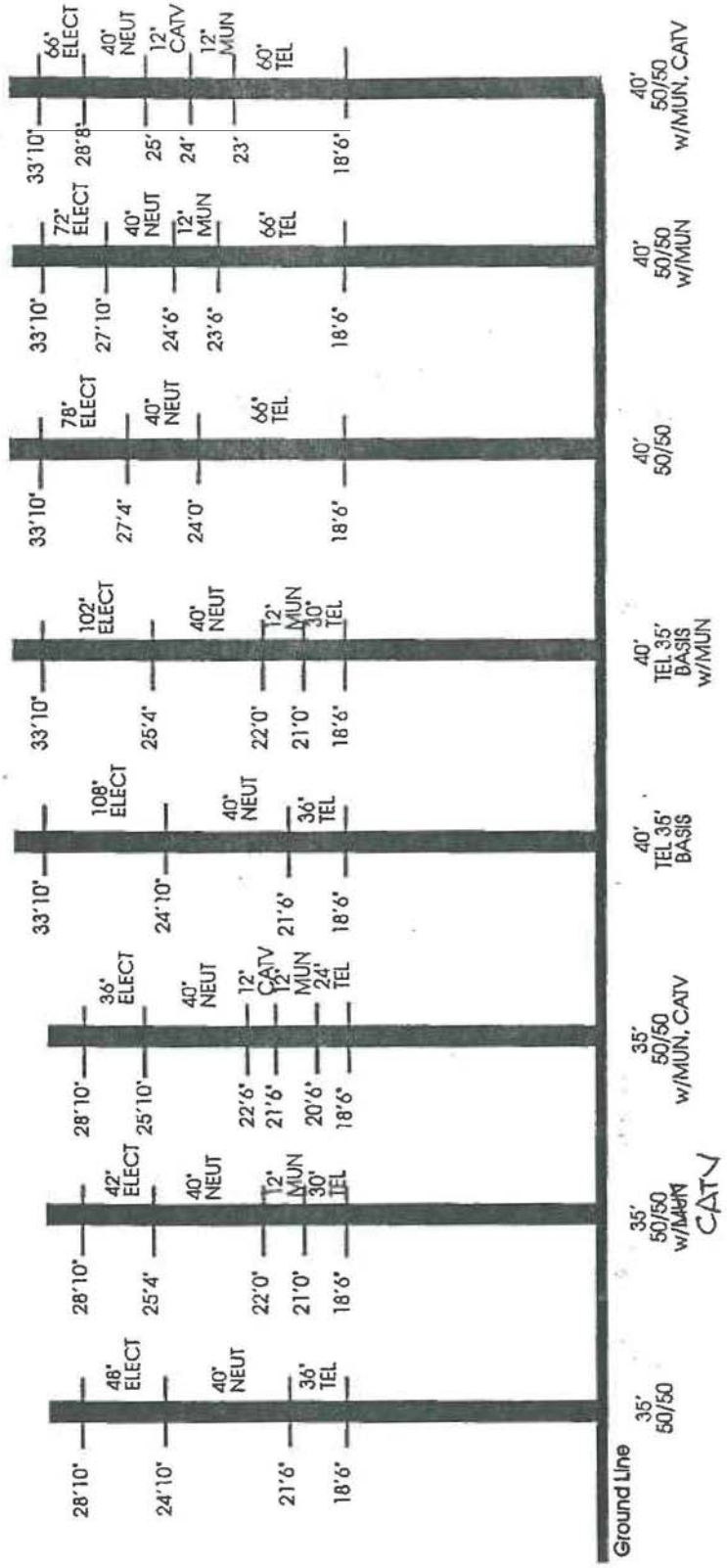
11.13 Clearances On Jointly Occupied Poles

11.14 Cable Extension Arms

11.15 Clearances From Licensee Attachments

11.16 Bibliography

Space Allocation

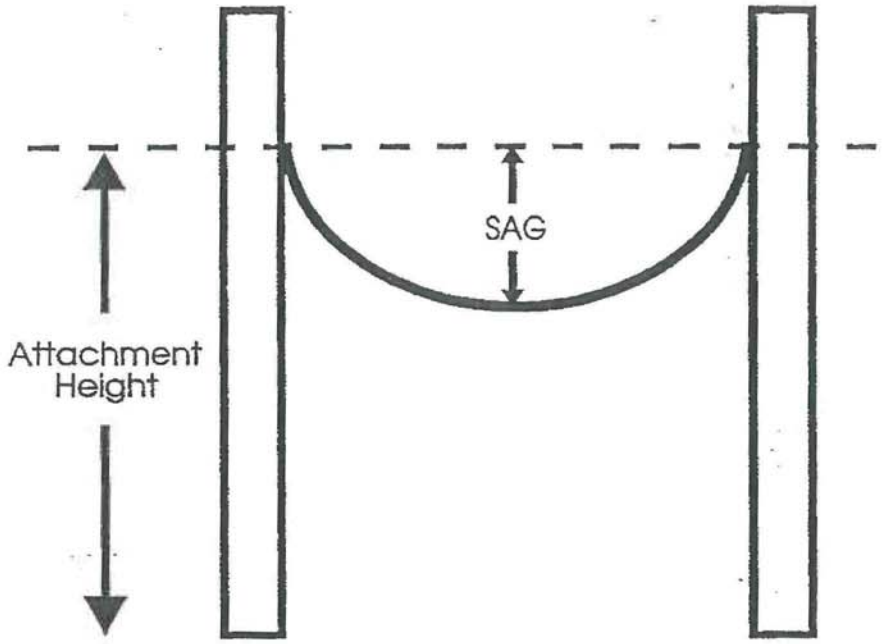


28' = HOA FOR PWR

(35' pole -
PWR to HOA will always be 28'
40' pole = 33' HOA
45' pole = 38' HOA

Cable Sag

Each cable has a sag which is dependent on the cable's weight and diameter. In a heavy storm load area, the weight of ice must also be factored in to the amount of sag.



Charts are available for the use in determining sags under various storm loading conditions:

BR 627-210-018	Suspension Strand Tension and Sags, Copper Conductor Cables
BR 627-700-011	Self Supporting Cable Stringing Sags and Tensions
BR 697-210-020	Optic Fiber Cable - Stringing Sags and Tensions

Clearances For Communications Facilities Crossing Over Roads, Alleys, Driveways, Walkways and Waterways

Situation	Clearance (Ft.)*
Public streets, roads, areas subject to traffic	15.5
Alleys, parking lots, non-residential driveways	15
Residential driveways	15**
Land traversed by vehicles (cultivated, grazing, orchard, forest)	15.5
Spaces or ways accessible to pedestrians only	9.5
Diving boards Clearance in any direction if horizontal can not be met	10 (horizontal) 14
Water of swimming pool	22
Water Areas: No Sailboating involved Sailboating on area of: a) Less than 20 acres b) 20-200 acres c) 200-2000 acres d) 2000 acres and over	14 17.5 25.5 31.5 37.5
Areas posted for rigging or launching sailboats: Clearance shall be 5 ft. greater than that required for size of water area served	

*All clearances are measured at maximum sag condition.
**11.5' clearance for service drops.

Clearance for Communications Facilities Running Along Public Rights - of - Way but Not Overhanging the Traveled Way

Where Facilities Run	Clearance (max. sag)	Comments
Urban or rural roads and streets	15.5 ft.	May be reduced to 15 ft. if poles are in back of curb or other obstruction.
Alleys, driveways, parking lots	15 ft.	May also cross
Roads in rural areas where it is unlikely that vehicles will cross under the line	13 ft.	May be reduced to 9.5 ft. if ground beneath line is considered accessible to pedestrians only.

Job Aid

Pole Class / Anchor / Guy Computer Directions

I. Pole Class - (Transverse, Part of Vertical, Part of Bending Moments - eccentric Loads)

STEP 1. Determine lbs./ft/ heavy storm load for communications space attachments (Tel., Munic., CATV)

HOW

1. To calculate the Tel. heavy storm load you need:

   a) Diameter of cable(s) being placed (Eng. Handbook /Notes database)
   b) Size of strand(s) (cable weight, span distance, clearances and sag)
   c) Cable lashed or on rings
   d) Any eccentric loads (terminals, interfaces, etc.)

2. Find out municipal and CATV (call them).

3. Refer to equivalent charts on the inside top left and middle of the slide guide.

   a) For Tel. read from left to right
      Diameter of Cable - Strand Size - Lashed or Rings

   b) Equivalent for CATV and municipal

STEP 2. Multiply (the answer to 1) by the adjustment factor to convert to 2' from top of pole

HOW:

1. To calculate you need:

   a) Height(s) of attachment
   b) Length of pole

2. Refer to adjustment factors chart on the inside bottom middle of the slide guide. You may have to interpolate (read between the lines).

STEP 3. Determine lbs./ft. heavy storm load for power attachments. no adjustment factor applied.

HOW:

A) Call power company for requirements.

B) Refer to equivalent charts on the inside top right of the slide guide.

STEP 4. Total (2) and (3) and set resultant figure on top line (TOTAL HEAVY STORM LOAD) opposite the SPAN LENGTH.

STEP 5. At hairline in bottom window, read POLE CLASS required for LINE CLASSIFICATION.

II **Guying** - Strand and Anchor requirements

NEED TO:

- Determine Pull on pole.
- Determine LEAD and HEIGHT
- Determine STRAND(S) you are guying for.
- Remember RULES for the number needed.

STEP 1a. **PRELIMINARY** - Get LEAD/HEIGHT ratio (L/H = decimal). Use calculator, your head, or **Scale C** as **LEAD** over **Scale D** as **HEIGHT** and read the L/H as a decimal in the small window.

STEP 1. Locate the **L/H** as a decimal on **Scale A.**

STEP 2. Set the PULL on the pole **Scale B** under **L/H.** This sets the STAGE.

STEP 3. Find the total TENSION you are guying for on **Scale C** (to calculate the tension, you find the equivalent tension for the strand(s) you are placing, e.g., 6M = 3.6M lbs. at the top of the slide guide).

STEP 4. Then read down to **Scale D** to find the anchor and guy required. (N.B. if you have a JB pole line classification, you must multiply the result by 1.33 before determining the anchor and guy equivalent.)

STEP 5. Relate the value from **Scale D** to a guy and anchor size from the Engineering handbook /Notes Database

III. Pole Class - Minimum Class Anchor Guyed Pole or Stub (Vertical Tension of Guys)

NEED TO:

- Determine **L/H** (Lead / Height) Ratio
- Determine total **Breaking Strength** of all guys.
- Determine length of pole required.

STEP 1. Set **L/H** over sum (Total) of anchor guys.

STEP 2. Read the minimum class for the specific pole length.

IV. Pole Class - Unguyed Corner Poles - (Part of Bending Moments)

NEED TO:

- Determine the Pull.
- Determine strand(s) you are guying for.
- Determine length of pole needed.

STEP 1. Set **Pull** on pole **(Scale B)** under **Guy to Stub (Scale A)**

STEP 2. Determine the tension equivalents for the strand(s) you are placing (charts on top of the guying side) and multiply the total tensions by .7 (adjusts to 2' from top of pole). Locate on **Scale F** - tension load. Read down to **Scale G** for the Pole class.

STEP 3. Check for the depth of set and note on plans.

Reply Exhibit 13

Pole Top Evaluation Form

Attacher [redacted]

Address of pole: MIAMI GARDENS RD SW SIDE 1 P NW OF SW 56TH AVE

Geographic Coordinates of Pole: Lat 25.977925 N, Long -80.198455 W

Is wind tunnel testing complete and successful (Circle One): (Y) or N Include test results.

Wind Load Requirements at the antenna location (Circle One): (Grade B) EWL _____ mph

Is the pole wood or concrete? WOOD
Pole Height: 45 ft, Pole Class: 2, Setting Depth: 7 ft

Wind Load: Maximum allowable moment on the existing pole 30585 ft-lbs

Calculated wind load on the existing pole after installation of equipment 7342.871 ft-lbs
Include calculations on a separate sheet

Basic Impulse Insulation Level (BIL) with existing FPL hardware: Before attachment 400
After attachment 210 Include calculations on a separate sheet

Calculated lightning flash collection rate: Before attachment .00158 flash/yr After attachment .001823 flash/yr
Include calculations on a separate sheet (Based on Flash Density of 14flashes/sq km /yr)

Is proposed pole accessible by bucket truck (Circle One)? (Y) or N

Is proposed pole adjacent to a major highway (Circle One)? Y or (N)

Is proposed pole adjacent water crossing (Circle One)? Y or (N)

Is proposed pole adjacent to state or federal protected land (Circle One)? Y or (N)

Will proposed pole meet the approval of the FAA (Circle One)? (Y) or N

Will proposed pole location require a beacon light (Circle One)? Y or (N)

Will proposed pole be considered an antenna structure by any agency if the antenna is affixed? (Circle One)? Y or (N)

Will proposed location readily accommodate the installation of the electrical meter in accordance with FPL standards (See FPL's Electric Service Standards filed with the Florida Public Service Commission) (Circle One)? (Y) or N

Will proposed location have an impact on wildlife as defined in the Environmental Impact Evaluation sheet located in the Permit Application Manual (Circle One)? Y or (N)

Page 1 of 2

Continued from Page 1

Will outreach to the community be made for this location (Circle One)? (Y) or N

Will work above the communication space (as defined in the NESC) be conducted by FPL approved (verified within the last two months) electrical contract line workers (Circle One) (Y) or N

Has contractor been told the facilities they will be working in and above are hot, lethal and are not to be de-energized (Circle One) (Y) or N

Does the pole require modifications to accommodate the attachment (Circle One)? (Y) or N

Describe and Explain: EXISTING 40/3-J POLE TO BE REPLACED WITH 46/2-J
SINGLE PAHSE POST TOP PRIMARY INSULATOR TO BE REPLACED WITH SIDE POST INSULATOR (VERTICAL FRAMING)

I certify that all the entries placed on this two page Pole Top Evaluation Form and the calculations that support them were made by me and are in compliance with the latest revisions of the National Electrical Safety Code, FPL's requirements or any other code or enforcement associated with this activity.

Licensee: [redacted]

By: [redacted]
SIGNATURE

TITLE

WINDLOAD B/L 4 F/St Da... ONLY

LICENSE No [redacted] STATE OF FLORIDA PROFESSIONAL ENGINEER

Engineer Seal

FPL Use Only	
☐ Approved	☑ Denied
☐ Approved, reserving for FPL's future plans	Denied by: ANGELO RODRIGUEZ
Approved by: _____	Date Denied: 1/22/2013
Date Approved: _____	Reason for denial: (Lack of Capacity) (Safety) (Reliability) (Applicable Engineering Concerns)
Signature: _____	See "Feasibility Analysis" for specificity of denial
	Signature: [signature]

Page 2 of 2

WIND LOAD CALCULATIONS

Date: 11/14/12

Pole # 11 2
Pole Type (wood/concrete) WOOD
Pole Class 2
Grade B or C Const. Pole Length 45
B Setting Depth 7
Span length 1 90
Span length 2 100
AVG SPAN 95

WINDLOADING MOMENT
ALLOWABLE 30585
CALCULATED 7343

Wind Loading OK? PASS (YES/NO)

Permit No. 73-12-105

CONDUCTORS		Number of Conductors		Wind Load Per Ft. (Table I)		Avg. Span Length		Height Above Ground	+	Setting Depth 3	=	MOMENT (ft.-lb.)
PRIMARY	SIZE											
PRI	2T	1	x	0.237	x	95	x	32.00	+	2.33	=	773.02
PRI	0	0	x	0	x	95	x	37.00	+	2.33	=	0.00
PRI	0	0	x	0	x	95	x	0.00	+	2.33	=	0.00
0	0	0	x	0	x	95	x	0.00	+	2.33	=	0.00
0	0	0	x	0	x	95	x	0.00	+	2.33	=	0.00
0	0	0	x	0	x	95	x	0.00	+	2.33	=	0.00
NEU.SEC	SIZE											
NEU	2T	1	x	0.237	x	95	x	24.33	+	2.33	=	600.40
0	0	1	x	0	x	95	x	29.00	+	2.33	=	0.00
0	0	1	x	0	x	95	x	0.00	+	2.33	=	0.00
0	0	1	x	0	x	95	x	0.00	+	2.33	=	0.00
0	0	1	x	0	x	95	x	0.00	+	2.33	=	0.00
0	0	1	x	0	x	95	x	0.00	+	2.33	=	0.00
FOREIGN UTILITIES		SIZE										
0		0	x	0	x	95	x	0.00	+	2.33	=	0.00
CATV		0.75	x	0.5625	x	95	x	19.83	+	2.33	=	1184.53
0		0	x	0	x	95	x	0.00	+	2.33	=	0.00
0		0	x	0	x	95	x	0.00	+	2.33	=	0.00
0		0	x	0	x	95	x	0.00	+	2.33	=	0.00
0		0	x	0	x	95	x	0.00	+	2.33	=	0.00
PROPOSED ATT		SIZE										
TELC		1	x	0.75	x	95	x	20.83	+	2.33	=	1650.63
								TOTAL MOMENT DUE TO CONDUCTORS			=	4208.57

EQUIPMENT		Wind Load Force in lbs			Height Above Ground	+	Setting Depth 3	=	MOMENT (ft.-lb.)
TRANSFORMERS	KVA								
1 Phase	37	41	x		40.5	+	2.33	=	1756.17
2 Phase	0	0	x		0	+	2.33	=	0.00
3 Phase	0	0	x		0	+	2.33	=	0.00
CAPACITORS									
0	1	x	0	x	0	+	2.33	=	0.00
REGULATORS									
0	1	x	0	x	0	+	2.33	=	0.00
RECLOSERS									
0	1	x	0	x	0	+	2.33	=	0.00
AUTOMATED SWITCH									
0	1	x	0	x	0	+	2.33	=	0.00

RISERS	SIZE	Riser Height above Grnd		Wind Load Force in lbs per ft.		Riser Height above Ground 2	+	Setting Depth 3	=	MOMENT (ft.-lb.)
RISER CONDUIT	2	38.00	x	1.7	x	19.00	+	2.33	=	1378.13
0	0	0.00	x	1.7	x	0.00	+	2.33	=	0.00
					TOTAL MOMENT DUE TO EQUIPMENT				=	3134.30 ft.-lb.
						TOTAL ALL MOMENTS			=	7342.871 ft.-lb.

WINDLOAD 2002 - 4 dyn2.f2

BIL
Permit# 73-12-105
Pole# p 11-2

	BIL KV	=	BIL insulator KV	+	BIL wood pole 55 KV/ft	insulator	P-N ft
Existing	400	=	180	+	220	35kv post top procelien	4
Proposed	210	=	210	+	0	45kv side post procelien	

permit# 73-12-105
pole# p 11-2
Address MIAMI GARDENS RD SW SIDE 1 P NW OF SW 56TH AVE

Lightning Flash Collection Rate

$N = N_g \times [28h^{0.6} - b] / 10$

N = Lightning Flash Collection Rate in Flashes/100 km/yr
N_g = Ground Flash density in flashes /km^2/yr
h = height of structure in meters
b = structure width in meters for pole line this is approx = 0

N_g for south Florida assumed value 14 flashes /km^2-year
from Electric Power Engineering Handbook by L.L.Grigsby
fig 6.3 data from VAISALA

$N = N_g \times 2.8\,h^{0.6}$

Flashes/100km /yr

						meters	feet
existing	158.0236 = N =	14 x	**11.2874**	existing height=		10.2108	33.5
proposed	182.2755 = N =	14 x	**13.01968**	proposed height=		12.954	42.5

NOTE the wire height will not change. Therefor the Lightning Flash collection rate for the line itself will not change. The calculated change will apply only to the pole being replaced.

N_{pole} = Lightning flash collection Rate for the Antenna-Pole
size of antenna = .407meters diameter use effective length of 1 meter
N in Flashes/100km /yr

Existing N_{pole} = N x Distance = N/100km (1meter) (km/1000meters) = 0.00158 flashes /year

Proposed N_{pole} = N x Distance = N/100km (1meter) (km/1000meters) = 0.001823 flashes /year

Feasibility Analysis

After reviewing the pole top evaluation for the pole located at:

Address of pole: MIAMI GARDENS RD SW SIDE 1 P NW OF SW 56TH AVE, West Park, FL
Geographic Coordinates of Pole: Lat 25.977925 N, Long -80.198455 W
Described as Pole 11-2 on permit # 73-12-105

Florida Power and Light Co. (FPL) is **denying** pole top access to this pole (Pole 11-2).

As a potential alternative to Pole 11-2 on permit # 73-12-105, might we suggest you consider the FPL pole 115 ft northwest of your requested location at the location below?

Approximately: 139 Miami Gardens Rd, West Park, FL
Lat 25.978208, Long -80.198611

FPL's precise concerns of your proposed pole top antenna at this location (and how they relate to lack of capacity, safety, reliability, or engineering purposes):

- Pole change-out would be required, either because the pole is not tall enough or the pole is not strong enough to accommodate the antenna attachment – Insufficient Capacity.

[redacted] requests that FPL replace Pole 11-2 with a taller pole (expand capacity) in order to accommodate the installation of your pole top antenna attachment. Due to our concerns for safety, reliability and applicable engineering purposes at this location, as discussed below, FPL will not change-out Pole 11-2 to accommodate your proposed installation.

- Proposed installation requires grounded cable to pass through the power supply space in a location where a work crew would not expect cable to exist, and is therefore unsafe. This also would alter the normal FPL work methods necessary to accommodate the antenna. – Safety and Reliability.

FPL's normal distribution work method for work in the primary electric work zone of Pole 11-2 does not include work methods for grounded and foreign cable passing through the primary work space. FPL crews are not trained to work in this environment and do not expect to encounter this construction when restoring power or maintaining facilities. The unfamiliarity aspect provides concern for FPL line worker safety and any mistake will potentially be a cause for an outage. Additionally, the increased work load to meet the equipotential grounding requirements [OSHA 1910.269(n)] to bond all the metal and additional ground wires during restoration activities associated with your proposed pole will result in longer outages, thereby reducing reliability to electric customers.

- Proposed pole location is a radial line that would isolate customers when an outage occurs – Reliability, Applicable Engineering Concerns.

For engineering and reliability reasons, FPL requires a pole top antenna to be installed on a pole that can be isolated from the system if conductor voltages are equal to or greater than primary voltage. This isolation provides FPL assurance that, if the antenna were to cause a problem, the

electric customers on both sides of the antenna pole can continue to be served when the antenna pole is isolated. In this situation, if the antenna on this particular pole were to cause an outage, FPL has no way to readily isolate Pole 11-2; all the customers on this particular circuit will be without electric service until the problem is resolved.

- Non-FPL construction standards are required to accommodate the installation of the antenna and/or equipment. – Applicable Engineering Concerns and Insufficient Capacity

To meet the FPL construction standard requirements and improve the basic impulse insulation level for pole top antenna installations, the standard 35 kV insulator for this location must be replaced with a non-standard 45 kV insulator. Pole 11-2 is in a 13 kV area. In 13 kV areas, FPL's existing practice when replacing insulators for electric purposes is to replace those insulators with 35kV insulators. For engineering reasons, FPL builds its system in a manner such that the material used by area is common from one pole to the next. Thus FPL creates standards to meet that requirement. When an FPL crew encounters a construction build, they should be able to identify the circuit voltage and be comfortable they understand the facilities they are working on. Replacing insulators with 45 kV insulators on Pole 11-2 for the attacher results in methods not normally employed by FPL in its operations and therefore Pole 11-2 has insufficient capacity.

- Proposed installation will result in a decrease of the Basic Impulse Insulation Level (BIL) level when compared to the BIL level prior to installation. BIL level can only be returned to an acceptable level by using construction methods and materials different from those used in FPL's own operations. – Safety, Reliability and Applicable Engineering Concerns.

Your calculation (210 kV) of the BIL at this location, after the proposed antenna installation, demonstrates that the installation of your equipment will reduce the insulation level of FPL's flashover protection on Pole 11-2 by 48%. Additionally your proposed installation will decrease the BIL level below FPL's design standard BIL level of 350 kV for Pole 11-2 (engineering concerns). Decreasing insulation levels and increasing flashover potential will, in turn, increase the likelihood of outages, increase the safety risk of those working around these facilities and expose FPL's and customers' facilities to a greater chance of damage resulting from flashovers (safety, reliability and applicable engineering concerns).

- The location of the antenna installation significantly increases the probability of lightning strikes– Safety, Reliability and Applicable Engineering Concerns.

While the most recent research on lightning flash density of this requested location shows that it is greater than 14 flashes/km^2/year, your calculation using 14 flashes/km^2/year demonstrates that your request for an antenna on Pole 11-2 will increase the probability risk of lightning strikes on the pole structure by fifteen percent. A more accurate approach to calculating lightning strikes is to include shielding factors. Your calculation does not take into account the shielding of surrounding objects (For Pole 11-2, there are two houses and several trees) that would deflect some of the direct lightning strikes on the Pole 11-2.

Feasibility Analysis

The number of strikes to a pole structure is directly related to the pole's height, the flash density of the location and a variant of the sum of shielding factors associated with objects surrounding the pole. IEEE demonstrates in Std. 1410-2004 the impact of shielding factor on the number of lightning strikes on a distribution line by using the formula $N_s = N[1-(\sum SF)]$. When the surrounding objects are close and taller or similar in height to the pole, the direct lightning strike possibility (or risk of lightning) approaches zero, because the sum of the shielding factors approach one (1). However when the proposed structure (Pole 11-2) is nine feet taller than the existing structure, the shielding factors associated with the surrounding shielding objects (which do not change height) rapidly diminish. An example of this diminishing effect is displayed in IEEE Std. 1410-2004 Figure 4. The resultant probability of lightning strikes to Pole 11-2 would increase to a number significantly greater than fifteen percent of the existing pole.

Any increase to the probability of direct lightning strikes presents an unacceptable increase of risk to electric customer reliability, crew safety, FPL's facilities and the property of FPL's electric customers.

Regarding your note on the calculation work sheet stating, "the wire height will not change. Therefor [sic] the Lightning Flash collection rate for the line itself will not change. The calculated change will apply only to the pole being replaced." -- this note does not address the fact that the direct lightning strike, that would have otherwise been shielded by surrounding objects, on the attacher's equipment or the top of Pole 11-2 will flashover from the attacher's cable or other facilities to FPL's facilities from the top of the pole or as it passes by the primary facilities. This flashover will cause an outage (reliability). See the following notes from IEEE 1410-2004, IEEE Guide for Improving the Lightning Performance of Electric Power Overhead Distribution Lines:

- "Lightning may have a significant effect on a line's reliability, especially if the poles are higher than the surrounding terrain. *More flashes are collected by taller structures.*"
- "Unless distribution-line insulation is protected with a shield wire or arresters, all direct lightning strikes *will cause* flashovers regardless of insulation level, conductor spacings, or grounding."
- "It is assumed that all flashovers *will cause* faults on the distribution circuit..." [Emphases added])

Even if a direct strike to the proposed antenna could be completely isolated from FPL's equipment by using methods not normally employed by FPL in its operation of Pole 11-2, the induced voltage from the (increased probable) strike in close proximity would be enough to cause an electrical outage by flashover (See IEEE Std. 1410-2004).

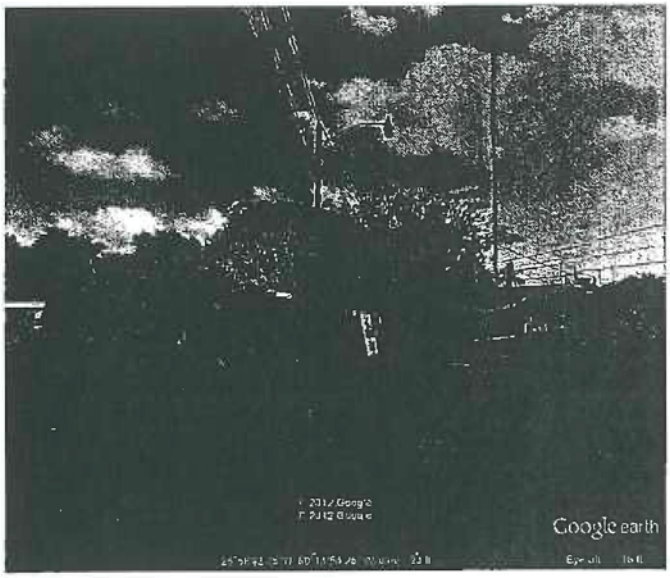
Potential Alternate Antenna Location:

As noted above, a potential alternative to Pole 11-2 on permit # 73-12-105, we suggest you consider the FPL pole 115 ft northwest of your requested location (see photo below).

Feasibility Analysis

Approximately:
139 Miami Gardens Rd, West Park, FL
Lat 25.978208, Long -80.198611

A pole top evaluation for this particular FPL pole would not be required. FPL will, of course, work with you on any pole you submit for evaluation.



Product Engineering Dept - FPL
5110 NW 159 Street Miami, FL. 33014
(305) 626-3003

January 22nd, 2013

Pole Top Evaluation Form

Attacher: [redacted]

Address of pole: 2107 3RD ST W , BRADENTON

Geographic Coordinates of Pole: Lat 27.480236 N, Long -82.565079 W

Is wind tunnel testing complete and successful (Circle One): (Y) or N Include test results.

Wind Load Requirements at the antenna location (Circle One): (Grade B) EWL _____ mph

Is the pole wood or concrete? WOOD
Pole Height: 45 ft, Pole Class: 2 , Setting Depth: 7 ft

Wind Load: Maximum allowable moment on the existing pole 30585 ft-lbs

Calculated wind load on the existing pole after installation of equipment 5870 ft-lbs
Include calculations on a separate sheet

Basic Impulse Insulation Level (BIL) with existing FPL hardware: Before attachment 372.5
After attachment 180 Include calculations on a separate sheet

Calculated lightning flash collection rate: Before attachment .00158 flash/yr After attachment .001836 flash/yr
Include calculations on a separate sheet (Based on Flash Density of 14 flashes/sq km /yr)

Is proposed pole accessible by bucket truck (Circle One)? (Y) or N

Is proposed pole adjacent to a major highway (Circle One)? Y or (N)

Is proposed pole adjacent water crossing (Circle One)? Y or (N)

Is proposed pole adjacent to state or federal protected land (Circle One)? Y or (N)

Will proposed pole meet the approval of the FAA (Circle One)? (Y) or N

Will proposed pole location require a beacon light (Circle One)? Y or (N)

Will proposed pole be considered an antenna structure by any agency if the antenna is affixed? (Circle One)? Y or (N)

Will proposed location readily accommodate the installation of the electrical meter in accordance with FPL standards (See FPL's Electric Service Standards filed with the Florida Public Service Commission) (Circle One)? (Y) or N

Will proposed location have an impact on wildlife as defined in the Environmental Impact Evaluation sheet located in the Permit Application Manual (Circle One)? Y or (N)

Continued from Page 1

Will outreach to the community be made for this location (Circle One)? (Y) or N

Will work above the communication space (as defined in the NESC) be conducted by FPL approved (verified within the last two months) electrical contract line workers (Circle One) (Y) or N

Has contractor been told the facilities they will be working in and above are hot, lethal and are not to be de-energized (Circle One) (Y) or N

Does the pole require modifications to accommodate the attachment (Circle One)? (Y) or N

Describe and Explain: EXISTING 40/3-J POLE TO BE REPLACED WITH 45/2-J
SINGLE PAHSE POST TOP PRIMARY INSULATOR TO BE REPLACED WITH SIDE POST INSULATOR (VERTICAL FRAMING)

I certify that all the entries placed on this two page Pole Top Evaluation Form and the calculations that support them were made by me and are in compliance with the latest revisions of the National Electrical Safety Code, FPL's requirements or any other code or enforcement associated with this activity.

Licensee: [redacted]

By: [redacted]
NAME OF REGISTERED (State of FLORIDA) ENGINEER (Print)

SIGNATURE

TITLE

FPL Use Only	
☐ Approved	☑ Denied
☐ Approved, reserving for FPL's future plans	Denied by: ANGELO RODRIGUEZ
Approved by: _____	Date Denied: 1/22/2013
Date Approved: _____	Reason for denial: Lack of Capacity, Safety, Reliability, Applicable Engineering Concerns
Signature: _____	See "Feasibility Analysis" for specificity of denial
	Signature: [signature]

Feasibility Analysis

After reviewing the pole top evaluation for the pole located at:

Address of pole: 2107 3RD ST W, Bradenton, FL Geographic Coordinates of Pole: Lat 27.480236 N, Long -82.565079 W Described as Pole 335 on permit # 73-12-107

Florida Power and Light Co. (FPL) is **denying** pole top access to this pole (Pole 335).

As a potential alternative to Pole 335 on permit # 73-12-107, might we suggest you consider the telephone pole at the location below?

Approximately: 505 22nd Av West Bradenton, FL
Lat: 27.480012 Long: -82.567264

FPL's precise concerns of your proposed pole top antenna at this location (and how they relate to lack of capacity, safety, reliability, or engineering purposes):

- Pole change-out would be required, either because the pole is not tall enough or the pole is not strong enough to accommodate the antenna attachment – Insufficient Capacity.

[redacted] requests that FPL replace Pole 335 with a taller pole (expand capacity) in order to accommodate the installation of your pole top antenna attachment. Due to our concerns for safety, reliability and applicable engineering purposes at this location, as discussed below, FPL will not change-out Pole 335 to accommodate your proposed installation.

- Proposed installation requires grounded cable to pass through the power supply space in a location where a work crew would not expect cable to exist, and is therefore unsafe. This also would alter the normal FPL work methods necessary to accommodate the antenna. – Safety and Reliability.

FPL's normal distribution work method for work in the primary electric work zone of Pole 335 does not include work methods for grounded and foreign cable passing through the primary work space. FPL crews are not trained to work in this environment and do not expect to encounter this construction when restoring power or maintaining facilities. The unfamiliarity aspect provides concern for FPL line worker safety and any mistake will potentially be a cause for an outage. Additionally, the increased work load to meet the equipotential grounding requirements [OSHA 1910.269(n)] to bond all the metal and additional ground wires during restoration activities associated with your proposed pole will result in longer outages, thereby reducing reliability to electric customers.

- Proposed pole location is a radial line that would isolate customers when an outage occurs – Reliability, Applicable Engineering Concerns.

For engineering and reliability reasons, FPL requires a pole top antenna to be installed on a pole that can be isolated from the system if conductor voltages are equal to or greater than primary voltage. This isolation provides FPL assurance that, if the antenna were to cause a problem, the